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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,768	12/13/2006	Hiroshi Shinoda	NITT.0330	8646

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REED SMITH LLP
3110 FAIRVIEW PARK DRIVE, SUITE 1400
FALLS CHURCH, VA 22042

EXAMINER	
GALT, CASSI J	

ART UNIT	PAPER NUMBER
3662	

MAIL DATE	DELIVERY MODE
05/29/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,768	SHINODA ET AL.	
	Examiner	Art Unit	
	CASSI GALT	3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/9/2006, 1/8/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements (IDS) submitted on 5/9/2006 and 1/8/2008 are being considered by the examiner. References lined through on IDS submitted 1/8/2008 are duplicate entries from the IDS submitted 5/9/2006.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. A suggested title is "Automotive radar with polarizing slit plate and radio wave absorbers".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, and 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartzstein (US 2005/0285773) in view of Boulingre (5,724,052).

Regarding claim 1, Hartzstein teaches an automotive radar (para. 2) comprising an antenna (34, Fig. 2) that radiates linear polarized radio waves (para. 105 lines 6-8), a slit plate (102, Fig. 3C) placed in front of the antenna, and a transceiver (Fig. 2) that supplies transmit signals to the antenna and, from received reflection waves detects a direction in which an obstruction exists (para. 45-46). Hartzstein does not teach radio

wave absorbers provided between the antenna and the slit plate. However, Hartzstein teaches that slit plate 102 is formed on the surface of a radome (100, Fig. 2), and Boulingre teaches a device for reducing the disturbing effect produced by the reflections of waves on a radome (col. 1 lines 9-11) comprising a radio wave absorber (30) placed between an antenna (10) and a radome (20). It would have been obvious to modify Hartzstein by providing a wave absorber between the antenna and the radome, and therefore necessarily between the antenna and the slit plate, in order to reduce the disturbing effect produced by the reflections of waves on the radome.

Regarding claim 2, Hartzstein teaches that the longitudinal direction of the slits is orthogonal to the direction of co-polarized waves radiated from the radiating element (para. 18 lines 3-6).

Regarding claims 4 and 5, the wave absorber taught by Boulingre blocks radiation in a top and bottom direction, and in a horizontal direction, as it surrounds the entire periphery of the antenna (col. 2 lines 28-38) for the purpose of reducing the disturbing effect produced by the reflections of waves on a radome (col. 1 lines 9-11). It would have been obvious to further modify Hartzstein by providing a wave absorber that blocks radiation in a top and bottom direction, and in a horizontal direction, in order to reduce the disturbing effect produced by the reflections of waves on the radome.

Regarding claim 6, Hartzstein teaches a radome (100) which Fig. 3B shows covers the antenna (34) and slit plate (102).

Regarding claim 7, Hartzstein teaches that at least one surface of the slit plate is brought in contact with the radome (para. 108 lines 5-8).

Regarding claim 8, Hartzstein's Fig. 3B makes it clear that the distance between the radome (100) and the antenna (34) is larger than the distance between the slit plate (102) and the antenna (34).

Regarding claim 9, Hartzstein teaches an automotive radar (para. 2) comprising an antenna (34, Fig. 2) that radiates linear polarized radio waves (para. 105 lines 6-8), a slit plate (102, Fig. 3C) placed in front of the antenna, and a transceiver (Fig. 2) that supplies transmit signals to the antenna and, from received reflection waves detects a direction in which an obstruction exists (para. 45-46). Hartzstein does not teach radio wave absorbers provided between the antenna and the slit plate to absorb radio waves being radiated in a direction orthogonal to a forward direction of the antenna. However, Hartzstein teaches that slit plate 102 is formed on the surface of a radome (100, Fig. 2), and Boulingre teaches a device for reducing the disturbing effect produced by the reflections of waves on a radome (col. 1 lines 9-11) comprising a radio wave absorber (30) placed between an antenna (10) and a radome (20). Boulingre's Fig. 2 shows that absorber 30 will absorb radio waves being radiated in a direction orthogonal to a forward direction of the antenna. It would have been obvious to modify Hartzstein by providing a wave absorber between the antenna and the radome, and therefore necessarily between the antenna and the slit plate, in order to reduce the disturbing effect produced by the reflections of waves on the radome.

Regarding claim 10, the limitations of claim 10 do not differ from those of claim 4 and are rejected on the same ground.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hartzstein (US 2005/0285773) in view of Boulingre (5,724,052) and further in view of Kakizaki (JP 2001127523).

Regarding claim 3, Hartzstein does not teach that the distance between the antenna and the slit plate falls within 1/8 to 1/2 wavelength at a frequency used by the radar. However, Hartzstein teaches that slit plate 102 is formed on the surface of a radome (100, Fig. 2), and Kakizaki teaches a radome designed such that the distance between the radome and an antenna is ½ to ¼ the center frequency of the antenna

(translated ab. lines 1-3) in order to achieve highly efficient radiation of power (translated ab. line 8). It would have been obvious to modify Hartzstein by placing the radome, and therefore the slit plate, at the claimed distance in order to achieve highly efficient radiation of power.

6. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartzstein (US 2005/0285773) in view of Brown (US 5,880,695).

Regarding claim 9, Hartzstein teaches an automotive radar (para. 2) comprising an antenna (34, Fig. 2) that radiates linear polarized radio waves (para. 105 lines 6-8), a slit plate (102, Fig. 3C) placed in front of the antenna, and a transceiver (Fig. 2) that supplies transmit signals to the antenna and, from received reflection waves detects a direction in which an obstruction exists (para. 45-46). Hartzstein does not teach radio wave absorbers provided between the antenna and the slit plate to absorb radio waves being radiated in a direction orthogonal to a forward direction of the antenna. However, Hartzstein teaches that slit plate 102 is formed on the surface of a radome (100, Fig. 2), and Brown teaches an antenna system wherein absorber material (56) fills a tunnel (54) between antenna elements (58) and a radome (62) for the purpose of reducing side and back lobes of the antenna elements (col. 2 lines 30-32). Brown's Fig. 3 shows that absorber material 56 will absorb radio waves being radiated in a direction orthogonal to a forward direction of the antenna. It would have been obvious to modify Hartzstein by providing a wave absorber between the antenna and the radome, and therefore necessarily between the antenna and the slit plate, that absorbs radio waves being radiated in a direction orthogonal to a forward direction of the antenna in order to reduce side and back lobes of the antenna.

Regarding claim 10, it is clear that Brown's absorber blocks radiation in a top and bottom direction, and absorber material 56 completely surrounds antenna elements 58 (see Figs. 2 and 3).

Conclusion

7. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Barnes (US 6,667,724) discloses an impulse antenna array and method including an absorber (1030, Fig. 10A) that reduces transmit-to-receive antenna coupling and therefore reduces radar clutter residue (col. 16 lines 45-49).

Suzuki (US 7,126,525) discloses a millimeter wave radar including radio wave absorbing layers (10, Fig. 2) that prevent unwanted reflection of sidelobes.

Honma (US 6,496,138) discloses an electromagnetic wave radar device mounted on a car including a radio wave absorber (35, Fig. 15) for suppressing adverse effects caused by noise.

Matsuoka (US 6,424,892) teach a vehicle surrounding monitoring device wherein metal slits are formed through which appropriately polarized electric waves may pass (see Figs. 6-8).

Ikeda (US 2006/0238404) discloses a radar device including electric wave absorbers (22).

Sasada (US 2006/0290564) disclose an on vehicle radar including a slit plate and radio wave absorbers

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CASSI GALT whose telephone number is (571)270-1469. The examiner can normally be reached on Mon-Fri 7:30AM-5:00PM, Alt. Fri, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

5/22/2008

CASSI GALT
Examiner, Art Unit 3662

/Thomas H. Tarcza/
Supervisory Patent Examiner, Art Unit 3662